

Title (en)  
Method and apparatus for performing noise cancelling in headphones.

Title (de)  
Methode und Gerät zur Geräuschunterdrückung in Kopfhörern.

Title (fr)  
Procédé et appareil pour réaliser la suppression de bruit dans des écouteurs.

Publication  
**EP 0468610 A2 19920129 (EN)**

Application  
**EP 91250205 A 19910725**

Priority  
US 55834290 A 19900727

Abstract (en)  
A device for performing electroacoustic functions including noise cancellation, communication interface, and headphone functions. The device includes a composite transducer which is connected to a control unit. The composite transducer, which is adapted for use with the human ear, includes at least three transducers, oriented to be substantially coplanar to each other: two oppositely oriented input transducers for converting acoustic waves into electrical signals, and at least one output transducer oriented facing the ear for converting electrical signals into acoustic waves. The control unit includes circuitry for driving the output transducer based on electrical signals from the input transducers with an amplitude and phase to perform the noise cancellation, sound filtering, communication interface, and headphone functions. The input transducer which is oriented facing the ear picks up residual noise present in the ear canal which was not cancelled by the first input transducer to output transducer signal path due to non-ideal frequency and amplitude characteristics. The second input transducer supplies an electrical signal corresponding to the residual noise to the control circuitry to cancel the residual noise. Additionally, the path of acoustic energy from a noise source, through the composite transducer, and to the ear canal can be lengthened by the addition of a baffle around which the acoustic energy must travel. <IMAGE>

IPC 1-7  
**G10K 11/16**; **H04R 1/10**; **H04R 3/00**

IPC 8 full level  
**A61F 11/14** (2006.01); **G10K 11/178** (2006.01); **H04R 1/10** (2006.01); **H04R 3/00** (2006.01)

CPC (source: EP US)  
**A61F 11/145** (2022.01 - EP); **G10K 11/17825** (2017.12 - EP US); **G10K 11/1783** (2017.12 - EP US); **G10K 11/17853** (2017.12 - EP US); **G10K 11/17857** (2017.12 - EP US); **G10K 11/17861** (2017.12 - EP US); **G10K 11/17881** (2017.12 - EP US); **G10K 11/17885** (2017.12 - EP US); **H04R 1/1083** (2013.01 - EP US); **H04R 3/005** (2013.01 - EP US); **A61F 11/145** (2022.01 - US); **B60G 2400/61** (2013.01 - EP US); **B60G 2800/012** (2013.01 - EP US); **G10K 2210/108** (2013.01 - EP US); **G10K 2210/1081** (2013.01 - EP US); **G10K 2210/3013** (2013.01 - EP US); **G10K 2210/3019** (2013.01 - EP US); **G10K 2210/3045** (2013.01 - EP US); **G10K 2210/3214** (2013.01 - EP US); **H04R 1/1008** (2013.01 - EP US); **H04R 5/033** (2013.01 - EP US)

Citation (applicant)  
• GB 1530814 A 19781101 - BRITISH AIRCRAFT CORP LTD  
• US 4644581 A 19870217 - SAPIEJEWSKI ROMAN [US]

Cited by  
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